
Bibliography

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(19) [Country of Issue] Japan Patent Office (JP)
(12) [Official Gazette Type] Open patent official report (A)
(11) [Publication No.] JP,10-14978,A
(43) [Date of Publication] January 20, Heisei 10 (1998)
(54) [Title of the Invention] An absorption sheet and its manufacture method
(51) [International Patent Classification (6th Edition)]
A61F 13/46
13/15
[FI]
A41B 13/02 B
A61F 13/18 307 E
[Request for Examination] Un-asking.
[The number of claims] 5
[Mode of Application] OL
[Number of Pages] 6
(21) [Filing Number] Japanese Patent Application No. 8-172528
(22) [Filing Date] July 2, Heisei 8 (1996)
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Epitome

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(57) [Abstract]
[Technical problem] the gel which superabsorbency material moved the absorption sheet used for a disposable diaper, sanitary items, etc. between the upper layer and a lower layer when a wearer moved, although it fills up with superabsorbency material between the upper layer and a lower layer, homogeneity did not distribute, but absorptivity fell and was produced by water absorption — a dumpling — it was what solidifies in a **, produces a tear and ****** of an absorption sheet, and gives a wearer displeasure.
[Means for Solution] the absorption sheet A — a middle lamella — it consists of 2, the 1st outer layer 1, and the 2nd outer layer 3, and comes to form much crevice 2a in an absorptivity sheet with which crepe processing of the medium-rise sheet 2 was carried out It is filled up with SAP4 in this crevice 2a, said medium-rise 2 sets up and down, and the 1st outer layer 1 and 2nd outer layer 3 are pasted up with the adhesives 5 of water-insoluble nature. Thus, since SAP4 is always contained in crevice 2a by constituting and swelling of SAP4 is not controlled, it is superabsorbency and the absorption sheet A is made into a thin shape.

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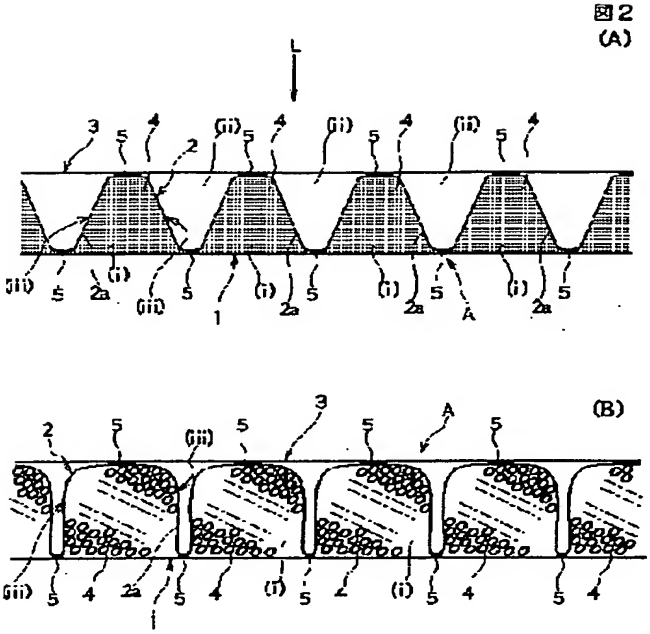

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CLAIMS

[Claim(s)]

[Claim 1] An absorption sheet which it has the following, and at least one side of this 1st outer layer and the 2nd outer layer is formed with a liquid-permeable sheet, and is characterized by joining said middle lamella and 1st outer layer, and a middle lamella and the 2nd outer layer. A middle lamella by which many crevices are formed in an absorptivity sheet which has a crepe Absorptivity resin held in said crevice The 1st outer layer put on said middle lamella so that a opening side of a crevice in which said absorptivity resin was held might be closed This 1st outer layer and the 2nd outer layer put on said middle lamella in a reverse side

[Claim 2] An absorption sheet according to claim 1 with which a field which permits expansion of said crevice at the time of said middle lamella and absorptivity resin absorbing liquid is prepared between crevices which a middle lamella adjoins while the 1st outer layer and 2nd outer layer.
[Claim 3] That the 2nd outer layer formed with a liquid-permeable sheet is turned to a side which receives liquid, the 1st outer layer is formed with a sheet with which fiber becomes dense from said 2nd outer layer, and said absorptivity resin comes out to the exterior out of a crevice by this 1st outer layer is the absorption sheet according to claim 1 or 2 prevented.
[Claim 4] A middle lamella, the 1st outer layer, and a middle lamella and the 2nd outer layer are an absorption sheet according to claim 1 to 3 each other joined by cementation means of water-insoluble nature.
[Claim 5] A manufacture method of an absorption sheet which is equipped with the following and characterized by forming at least one side of said 1st outer layer and 2nd outer layer with a liquid-permeable sheet. The 1st production process which carries out pressing of many crevices to an absorptivity sheet which has a crepe, and forms a middle lamella The 2nd production process which puts absorptivity resin into said medium-rise crevice The 3rd production process which joins the 1st outer layer to said middle lamella so that a opening side of a crevice in which said absorptivity resin was held may be closed A production process which joins the 2nd outer layer to said middle lamella in said 1st outer layer and reverse side after said 1st production process

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] This invention relates to the absorption sheet prepared in a disposable diaper, a sanitary napkin, etc., especially

relates to the absorption sheet and its manufacture method of superabsorbency with a thin shape.

[0002]

[Description of the Prior Art] In a disposable diaper or a sanitary napkin, the absorption sheet for absorbing body fluid, such as urine and menstrual blood, between the top sheets of the direct this slack inside is prepared at the sheathing sheet which consists of the resin sheet of non-liquid permeability, and a wearer's skin. Generally that between which it was placed by water-absorbing resins (high absorptivity polymer; SAP), such as polyacrylate, is used for the pulp with which this absorption sheet was ground between the upper layers, such as tissue paper, and a lower layer. More than pulp, since absorbency is high, SAP is excellent in the absorptivity of body fluid compared with what constituted the absorption sheet only from pulp, and can carry out [thin shape]-izing of the absorption sheet. Moreover, since it will be swollen if SAP absorbs water (liquid absorption), and it solidifies in gel, it can hold the absorbed body fluid certainly in an absorption sheet, and can prevent reversion of the absorbed body fluid, a leak, etc. Moreover, since SAP will serve as gel if it is powdered (granular) and absorbs water at the time of desiccation, compared with the thing only using pulp, an absorption sheet becomes soft, and it can accompany the form of a wearer's body, can deform easily, and becomes good [a feeling of wearing].

[0003]

[Problem(s) to be Solved by the Invention] However, if the amount of SAP to pulp is made [many] in order to raise absorptivity, SAP powder will move between the upper layer and a lower layer by motion of a wearer at the time of the desiccation before water absorption, and unevenness will be made to distribution of SAP. Therefore, when body fluid touches a portion with little SAP, body fluid will not be able to be absorbed completely but absorptivity will fall. moreover, between the upper layers and lower layers — moving — a dumpling — it solidified in the **, and a tear and ****** of two-layer tissue paper arose with this lump, and there were problems, such as giving a wearer displeasure. [gel / which was formed of water absorption]

[0004] In order to solve the above problem, invention about the absorption sheet which high absorptivity material opened the specified quantity [every] gap, and it has been arranged on a sheet at JP,63-23078,Y, and distributed all over the sheet, and JP,61-30041,B, JP,6-254118,A and JP,7-73591,B, and the cover sheet in which irregularity was formed from on this were put, and was joined to said sheet is indicated further. Thus, in what was pressed down so that high absorptivity material might be distributed by the whole specified quantity [every] absorption sheet at homogeneity and it might not move from an arrangement location by the cover sheet, migration within the absorption sheet of high absorptivity material can be prevented, the thickness of an absorption sheet can be kept constant on the whole, and, moreover, a coefficient of water absorption can be made [many].

[0005] However, with the aforementioned absorption sheet, when putting a cover sheet, alignment must be carried out so that high absorptivity material may be contained by the crevice of a cover sheet, and manufacture takes time and effort. Moreover, since it is necessary to enlarge the depth and the path of a crevice of said cover sheet, and to make space in a crevice larger than the amount of high absorptivity material so that swelling of high absorptivity material may not be barred, the thickness size of an absorption sheet becomes large and produces a limit in thin shape-ization. Moreover, if space of the crevice of said cover sheet is made small in order to thin-shape-ize, the swelling of high absorptivity material will be barred by the crevice at the time of water absorption, and absorptivity will fall.

[0006] When the above-mentioned conventional technical problem is solved, and migration of the high absorptivity material within an absorption sheet can be prevented and it absorbs water, as this invention can be swollen within a sheet, it is the superabsorbency which made the swelling to the thickness direction hard to produce, and it aims at offering a thin absorption sheet and its thin manufacture method.

[0007]

[Means for Solving the Problem] A middle lamella by which many crevices are formed in an absorptivity sheet with which an absorption sheet of this invention has a crepe, Absorptivity resin held in said crevice, and the 1st outer layer put on said middle lamella so that a opening side of a crevice in which said absorptivity resin was held might be closed, It is characterized by having this 1st outer layer and the 2nd outer layer put on said middle lamella in a reverse side, forming at least one side of this 1st outer layer and the 2nd outer layer with a liquid-permeable sheet, and joining said middle lamella and 1st outer layer, and a middle lamella and the 2nd outer layer.

[0008] Furthermore, a field which permits expansion of said crevice at the time of said middle lamella and absorptivity resin absorbing liquid is prepared between crevices which a middle lamella adjoins while the 1st outer layer and 2nd outer layer.

[0009] Moreover, the 2nd outer layer formed with a liquid-permeable sheet is turned to a side which receives liquid, the 1st outer layer is formed with a sheet with which fiber becomes dense from said 2nd outer layer, and that said absorptivity resin comes out to the exterior out of a crevice by this 1st outer layer can make it structure prevented.

[0010] As for a middle lamella, the 1st outer layer, and a middle lamella and the 2nd outer layer, in the above, it is desirable to be mutually joined by cementation means of water-insoluble nature.

[0011] Moreover, the 1st production process which a manufacture method of an absorption sheet of this invention carries out pressing of many crevices to an absorptivity sheet which has a crepe, and forms a middle lamella, The 2nd production process which puts absorptivity resin into said medium-rise crevice, and the 3rd production process which joins the 1st outer layer to said middle lamella so

that a opening side of a crevice in which said absorptivity resin was held may be closed, It is characterized by having a production process which joins the 2nd outer layer to said middle lamella, and forming at least one side of said 1st outer layer and 2nd outer layer with a liquid-permeable sheet in said 1st outer layer and reverse side, after said 1st production process.

[0012] A disposable diaper, a sanitary napkin, etc. are loaded with an absorption sheet of this invention, and it is used as a water absorption object. In an actual busy condition, a resin sheet of non-liquid permeability is prepared in an outside of one outer layer of an absorption sheet of this invention as a sheathing sheet, and a top sheet referring to the skin is prepared in an outside of an outer layer of another side. The 1st outer layer which has taken up a medium-rise crevice with this invention is preferably turned to said sheathing sheet side, the 2nd outer layer is turned to a top sheet side, and this 2nd outer layer becomes a side which receives liquid.

[0013] Crepe processing is performed to absorptivity sheets, such as rayon paper or pulp paper, many detailed wrinkles are formed, and, as for a middle lamella, that by which pressurization formation of the crevice a large number carried out [the crevice] mutually-independent to the whole surface further was carried out with a concavo-convex roller is used. If a middle lamella absorbs liquid, a water absorption sheet with which a detailed wrinkle by said crepe processing is come loose and recovered, and constitutes a middle lamella can be extended. Into said crevice, a water-absorbing resin (high absorptivity polymer; SAP) of high absorptivity and water retention, such as polyacrylate, is held. As this SAP, various things, such as synthetic polymer systems, such as said polyacrylate system, a polyvinyl alcohol system, and a polyacrylamide system, or a starch system, and a cellulose system, are usable. Moreover, either [at least] the 1st medium-rise outer layer piled up up and down or the 2nd outer layer is formed with a sheet which has liquid permeability, such as for example, rayon paper and rayon span REISU. Moreover, it does not necessarily need to be the liquid-permeable sheet which is turned to a side which does not receive liquid among the 1st outer layer and the 2nd outer layer.

[0014] If SAP held in a medium-rise crevice absorbs body fluid, such as urine and menstrual blood, it will swell and will become gel. Since a middle lamella in which a crevice in which SAP is held was formed is constituted from this invention by absorptivity sheet which has a crepe, a crepe wrinkle in a crevice is extended at the same time SAP swells. Swelling of SAP is not barred by elongation of a wrinkle of this crepe, but a water absorption function of SAP can fully be employed efficiently. If a field (ii) is formed between crevices in which SAP by which a middle lamella adjoins between the 1st outer layer and the 2nd outer layer was held as shown especially in drawing 2 (A), this field (ii) will permit expansion of a crevice and a crevice will fully swell. Therefore, even if liquid adsorption increases, a gap of the 1st outer layer and the 2nd outer layer seldom spreads, and the whole thickness size does not become not much large after liquid absorption.

[0015] Thus, that what is necessary is to just be formed in magnitude of a degree to

which space capacity in a crevice before water absorption can contain SAP powder of dryness since a medium-rise crevice can expand by liquid absorption and the expansion field can also be secured between the 1st outer layer and the 2nd outer layer, like the conventional example, since it is not necessary to form space for SAP to swell in a field in which SAP is held, the depth of a crevice can be made small. Moreover, it is possible to be able to make high a rate of hold of SAP into a crevice, for example, to hold SAP at 70% or more of rate to capacity of a crevice, and it is high absorptivity and becomes a thin thing.

[0016] Moreover, in order to enable it to permit swelling of SAP held in a crevice, it is desirable that a pace of expansion (rate of a crepe) of a sheet by crepe processing is 65% or less at 5% or more. When a size after floating on X the length of an absorptivity sheet by which crepe processing was carried out, floating this on water and being extended is set to deltaX, a pace of expansion (rate of a crepe) of this crepe, it is expressed with {(deltaX-X) /X} x100(%).

[0017] Moreover, after SAP is held in a crevice of an absorptivity sheet which constitutes a middle lamella, although the 1st outer layer and 2nd outer layer are joined up and down, a medium-rise thing for which a cementation means of water-insoluble nature is used for this cementation is desirable.

[0018] A cementation means of this water-insoluble nature weaves polyethylene or polypropylene into others, a middle lamella, the 1st outer layer, and the 2nd outer layer, and after it piles up these three layers, it includes a means of carrying out heat joining and joining. [adhesive joint / by hot melt adhesive of for example, an olefin system (polyethylene or polypropylene) or an EVA system] By joining a middle lamella, the 1st outer layer, and a middle lamella and the 2nd outer layer with a cementation means of water-insoluble nature, bonding strength between each class when absorbing body fluid is highly maintainable.

[0019] When using said hot melt adhesive, said adhesives are applied for example, in the shape of a spiral (spiral), and are joined to a middle lamella by plane of composition of the 1st outer layer and the 2nd outer layer, respectively.

[0020] As shown in drawing 2 (A), the 1st outer layer is joined between opening sides of a medium-rise crevice, and the 2nd outer layer is joined to a middle lamella at a bottom side of said crevice. Thus, at the opening perimeter of a crevice, and a bottom of a crevice, since a middle lamella is joined by the 1st outer layer and 2nd outer layer, SAP is certainly held in a crevice and migration of SAP within an absorption sheet is prevented. Moreover, as shown in drawing 2 (A), a field (ii) where a crevice expands between the 1st outer layer and the 2nd outer layer is securable. therefore, a gel lump of SAP which SAP was distributed by homogeneity in an absorption sheet, and the absorptivity of an absorption sheet did not fall, and was formed of water absorption — moving — a dumpling — it does not solidify in a ** and can expand now in the 1st outer layer and the 2nd outer layer. Therefore, when liquid is absorbed, SAP can be made to absorb to homogeneity, and a sheet does not become extremely thick after absorption.

[0021] Moreover, the 1st outer layer and 2nd outer layer of an absorption sheet are rayon paper, rayon span REISU, etc., the 1st outer layer is joined to a middle lamella so that a opening side of a medium-rise crevice may be closed, and the 2nd outer layer is joined to a middle lamella on a base of a crevice. A disposable diaper etc. is loaded so that this 2nd outer layer may be turned to a body fluid acceptance side (a top sheet side). Since the 2nd outer layer is turned to a side which receives body fluid, ****** or a nonwoven fabric is used for an eye so that body fluid can be penetrated. Moreover, it is desirable that paper or a nonwoven fabric with a dense eye is used for the 1st outer layer so that SAP in a medium-rise crevice may not leak outside from between eyes of an outer layer. Thus, two sorts of papers or a nonwoven fabric with which granularity of an eye differs is used for the 1st outer layer and 2nd outer layer. Or the same nonwoven fabric with which polyethylene (PE) or polypropylene (PP) was woven in is used as the 1st outer layer and 2nd outer layer, and a heat roller is covered over the 1st outer layer, and woven-in PE or PP is melted, an eye is blocked, it is made dense, and you may make it SAP in a crevice not fall.

[0022] Thus, since homogeneity can be made to be able to distribute SAP in an absorption sheet in this invention and space in a medium-rise crevice can be extended according to swelling of SAP, it is superabsorbency and a thin absorption sheet can be offered.

[0023]

[Embodiment of the Invention] It is the fragmentary sectional view in which the decomposition perspective diagram in which drawing 1 shows the configuration of the layer of the absorption sheet of this invention, and drawing 2 show typically the water absorption (liquid absorption) function of an absorption sheet, drawing 2 (A) shows dryness (condition before liquid absorption), and drawing 2 (B) shows the condition after water absorption (liquid absorption). the absorption sheet A shown in drawing 1 — between the 1st outer layer 1 and the 2nd outer layer 3 — a middle lamella — it has a laminated structure of three layers into which 2 was inserted. By the actual busy condition, although the 1st outer layer 1 is turned upward and drawing 1 shows it, as shown in drawing 2 (A) and (B), the 1st outer layer 1 turns into a lower layer, the 2nd outer layer 3 turns into the upper layer, and this 2nd outer layer 3 is turned to the side which receives the body fluid L, such as urine and menstrual blood.

[0024] The 1st outer layer 1 and 2nd outer layer 3 are both formed from the paper or the nonwoven fabric of permeable [, such as rayon paper or rayon span REISU,] or liquid permeability, and the eyes are 15 - 25 g/m2. Many detailed wrinkles of the sense to which crepe processing is performed to absorptivity sheets, such as rayon paper or pulp paper, and sheets and medium-rise 2 cross at right angles in the length direction (the direction of X) are formed. The eyes before crepe processing of an absorptivity sheet are 15 - 25 g/m2. If this absorptivity sheet absorbs moisture, the detailed wrinkle by said crepe processing will get loose, it will recover, and an

absorptivity sheet will be extended in the direction of X. Pressing of the crevice 2a the absorptivity sheet used as medium-rise 2 was inserted into the roller of the pair constituted so that much irregularity might be formed and it might gear mutually, and was sent out, consequently a large number carried out [the a] mutually-independent is carried out.

[0025] As shown in drawing 2 (A) and (B), the water-absorbing resins (SAP) 4, such as polyacrylate, are held in said two or more crevice 2a. said SAP4 — high absorptivity — it is — the time of desiccation — powder — or it will swell, if it is granular and moisture is absorbed, and it becomes gel. the hot melt adhesive 5 which is the water-insoluble nature adhesives of polyolefine systems, such as polyethylene (PE) or polypropylene (PP), or an EVA system applies to the plane of composition of the 1st outer layer 1 and the 2nd outer layer 3 — having — between both this layer — a middle lamella — 2 should be caught — a middle lamella — 2; the 1st outer layer 1, and medium-rise 2 and the 2nd outer layer 3 are joined.

[0026] the absorption sheet A of a three-tiered structure shows to drawing 2 (A) — as — a middle lamella — 2 and the 1st outer layer 1 are joined with glue in the opening periphery section of crevice 2a — having — a middle lamella — 2 and the 2nd outer layer 3 are joined with glue at the pars basilaris ossis occipitalis of crevice 2a. Since opening of crevice 2a is closed in the 1st outer layer 1, the saccate section (i) is formed in crevice 2a and the 1st outer layer 1, and SAP4 is stopped in this saccate section (i), and is held. Therefore, SAP4 does not move by motion of a wearer in the inside of the absorption sheet A.

[0027] Since SAP4 is held at said saccate section (i) and is distributing to constant-rate [every] homogeneity in the absorption sheet A, in the large range of the absorption sheet A, uniform high absorptivity is securable. Moreover, since cementation of layers is joined with the adhesives 5 of water-insoluble nature, when body fluid is given, the bond strength for a joint does not fall. Therefore, after absorbing body fluid, three layers do not separate mutually and migration of SAP4 within the absorption sheet A can be prevented. moreover, the time of absorbing body fluid, since it distributes in each saccate section (i) and SAP4 is formed optimum dose every — much SAP — a dumpling — it does not solidify in a **, each class is torn to pieces, ****** can be prevented, and displeasure is not given to a wearer. moreover, the 1st outer layer 1 and a middle lamella — even if 2 and the 2nd outer layer 3 are alike, respectively, it weaves in PE or PP resin and it makes it paste up by heat joining, the cementation means of water-insoluble nature is realizable similarly.

[0028] moreover, it is shown in drawing 2 (A) — as — between the 1st outer layer 1 and the 2nd outer layer 3 — setting — a middle lamella — between crevice 2a (saccate section (i)) which 2 adjoins, the field (ii) which the 1st outer layer 1 and 2nd outer layer 3 do not paste up is formed. When SAP4 which absorbed body fluid swells and the saccate section (i) expands, said field (ii) can permit this expansion. the absorptivity (it has crepe) sheet with which crepe processing of the manufacture

method of this absorption sheet A was carried out as mentioned above — much crevice 2a — pressing — carrying out — a middle lamella — after deciding the configuration of 2, powdered or grain-like SAP4 is held in said crevice 2a, and the 1st outer layer 1 is joined to the opening side of crevice 2a with adhesives 5 in piles. moreover, either of said production processes — setting — a middle lamella — the 2nd outer layer 3 is piled up and it joins to the pars-basilaris-ossis-occipitalis side of crevice 2a of 2 with said adhesives 5. In addition, said adhesives 5 are applied to the plane of composition of the 1st outer layer 1 and the 2nd outer layer 3 in the shape of a spiral in the case of this cementation.

[0029] With this absorption sheet A, since body fluid is given from the 2nd outer layer 3 side, the sheet which was excellent in the liquid permeability of paper with a coarse eye or a nonwoven fabric so that the 2nd outer layer 3 might make body fluid penetrate is used. Moreover, as for the 1st outer layer 1, paper or a nonwoven fabric with a dense eye is used so that the powder of SAP4 in crevice 2a may not leak outside at the time of the desiccation before water absorption. Moreover, the 1st outer layer 1 does not necessarily need to be a liquid-permeable sheet. Since the granularity of an eye differs, the 1st outer layer 1 and 2nd outer layer 3 are used for two kinds of papers or the nonwoven fabric of **, manufacturing that an eye is dense. or a middle lamella, when PE or PP is woven into 2, the 1st outer layer 1, and the 2nd outer layer 3 and these three layers are joined by heat joining The nonwoven fabric same as the 1st outer layer 1 and 2nd outer layer 3 is used, at the time of heat joining, melting of PE or PP in a nonwoven fabric is carried out covering a hot calender roll over the 1st outer layer 1 too much, an eye is blocked, and, thereby, the leak of SAP4 may be prevented.

[0030] After medium-rise 2, the 1st outer layer 1, and the 2nd outer layer 3 are joined and the absorption sheet A is formed, cutting of pattern ****, cutting with a cutter edge, or a water jet is performed, and it is judged by the predetermined configuration according to the form of a disposable diaper, a sanitary napkin, etc. And it is turned to the top sheet side who touches the side to which the 2nd outer layer 3 receives body fluid, i.e., a wearer's skin, the 1st outer layer 1 is turned to the lateral sheathing sheet of non-liquid permeability, and it is loaded with the absorption sheet A between a sheathing sheet and a top sheet.

[0031] if body fluid is given to the 2nd outer layer 3 from the side which the disposable diaper or sanitary napkin loaded with this absorption sheet A is worn, and is shown by L by drawing 2 (A) — body fluid — the 2nd outer layer 3 — penetrating — a middle lamella — it is absorbed by SAP4 while being absorbed by the absorptivity sheet which constitutes 2. SAP4 absorbs and swells body fluid and becomes gel. the middle lamella which absorbed body fluid — the wrinkle of crepe processing comes loose and 2 is recovered. Therefore, the capacity of crevice 2a becomes expandable and SAP4 can be swollen with the breadth of the wall of crevice 2a. Since opening and the pars basilaris ossis occipitalis of crevice 2a are joined by the 1st outer layer 1 and 2nd outer layer 3 with the adhesives 5 of water-

insoluble nature, respectively at this time, the elongation by recovery of the crepe wrinkle when absorbing liquid is controlled in the portion to which adhesives 5 are applied, and it comes to be extended comparatively freely by the amount of [of crevice 2a] (iii) circumferential wall. Therefore, as shown in drawing 2 (B), crevice 2a (saccate section (i)) expands in the field (ii) of the side by the swelling of SAP4. This field (ii) permits expansion of the saccate section (i), and in jointing by the adhesives 5 of water-insoluble nature, since recovery of the crepe wrinkle of medium-rise 2 is controlled, even after absorbing body fluid, a thin condition is maintainable [with the swelling of SAP4 / the amount of expansion to the thickness direction of an absorption sheet decreases comparatively, and].

[0032] Although the expansion condition of said crevice 2a (saccate section (i)) changes with rates of formation of a crepe If the breadth of crevice 2a is controlled as a crepe pace of expansion is 5% or less, sufficient absorptivity cannot be realized but a crepe pace of expansion is 65% or more crevice 2a -- large -- being extended -- passing -- a middle lamella -- the ratio of the plane-of-composition product by the adhesives 5 of the water-insoluble nature to the whole surface product of 2 falls extremely, and the reinforcement of the whole absorption sheet falls. Moreover, crevice 2a (saccate section (i)) expands greatly that a crepe pace of expansion is said 65% or more not only in the inside of a field (ii) but in the thickness direction, and the thickness size of the absorption sheet after body fluid absorption becomes large superfluously. therefore, a middle lamella -- as for 2, it is desirable to carry out crepe processing so that the pace of expansion of a crepe may become 65% or less at 5% or more. Moreover, the usual crepe processing is processed so that a wrinkle may be prolonged in the direction which intersects perpendicularly in the length direction (the direction of X) of an absorptivity sheet, but if crossing shaping of the crepe processing is carried out towards the both sides of the length direction, the direction which intersects perpendicularly, and the length direction, crevice 2a can be made to expand in all the directions, and the swelling of SAP4 can be permitted still more effectively.

[0033] the detailed wrinkle in which said crevice 2a was formed of crepe processing -- getting loose (recovery) -- since it expands corresponding to the swelling of SAP, in the dryness before water absorption (liquid absorption), it is possible for it not to be necessary to open space required for SAP4 to swell in crevice 2a, and to hold SAP4 with 70% or more of rate of hold in crevice 2a. Moreover, the liquid adsorption per unit area of an absorption sheet can be set up with the number and the depth of said crevice 2a. In order to fully secure the urine in the absorption sheet A, and the absorbed amount of menstrual blood, it is desirable to set the partition number of crevice 2a as or less [13 //cm] 2 degree or more [2 //cm] by two. Moreover, the size, the length in opening of crevice 2a and width, of two sides is 3-5mm, and by setting the depth of crevice 2a as about 1-3mm, body fluid can fully be absorbed by SAP4 in a crevice, a thickness size does not become not much large, but it will become desirable.

[0034]
[Effect of the Invention] Since absorptivity resin is held in the crevice formed all over the middle lamella according to the absorption sheet of this invention as explained in full detail above, it is possible to make the whole absorption sheet distribute absorptivity resin to homogeneity. Moreover, since the field where the swelling of breadth and absorptivity resin can be permitted, and said crevice expands between outer layers is formed when said crevice absorbs water, the absorption function of absorptivity resin can fully be demonstrated and, high moreover, absorptivity can realize a thin absorption sheet.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The decomposition perspective diagram showing the layer structure of the absorption sheet of this invention,
[Drawing 2] (A) is the cross section of the absorption sheet before water absorption, and (B) is the cross section of the absorption sheet after water absorption,
[Description of Notations]
1 1st Outer Layer
2 Middle Lamella
2a Crevice
3 2nd Outer Layer
4 SAP
5 Adhesives of Water-insoluble Nature
A Absorption sheet
(i) Saccate section
(ii) Field

[Translation done.]

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.

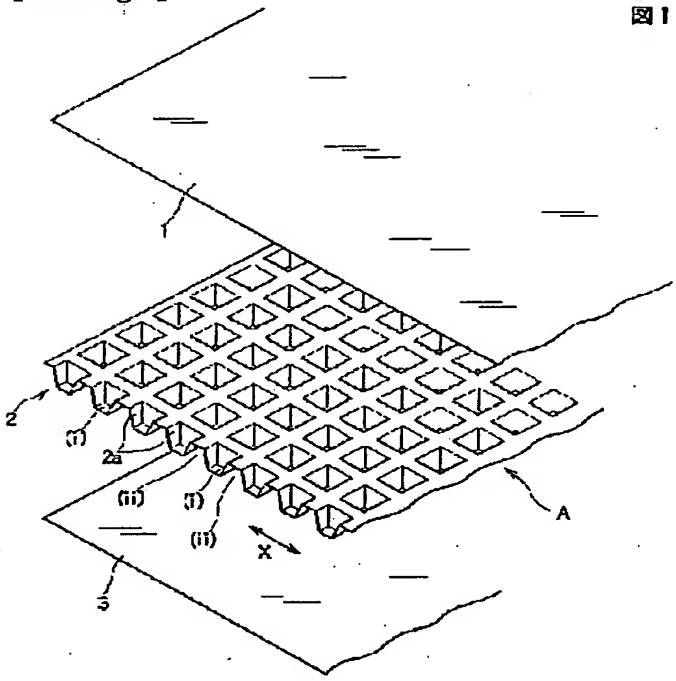
2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DRAWINGS

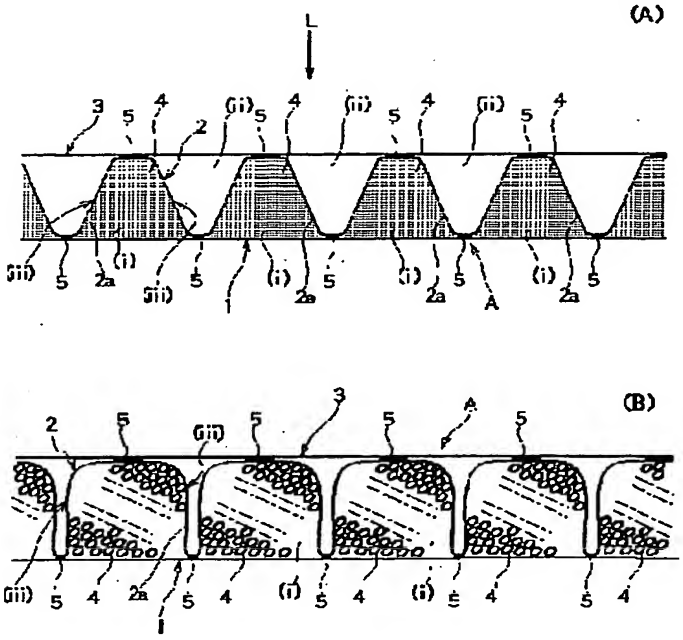
[Drawing 1]

図1



[Drawing 2]

図2



[Translation done.]

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（Ａ）　(11)特許出願公開番号

特開平10－14978

(43)公開日　平成10年(1998)１月20日

(51)Int.Cl.[6]	識別記号	庁内整理番号	ＦＩ		技術表示箇所
Ａ６１Ｆ　13/46			Ａ４１Ｂ　13/02	Ｂ	
13/15			Ａ６１Ｆ　13/18	３０７Ｅ	

審査請求　未請求　請求項の数５　ＯＬ　（全６頁）

(21)出願番号　特願平8－172528

(22)出願日　平成８年(1996)７月２日

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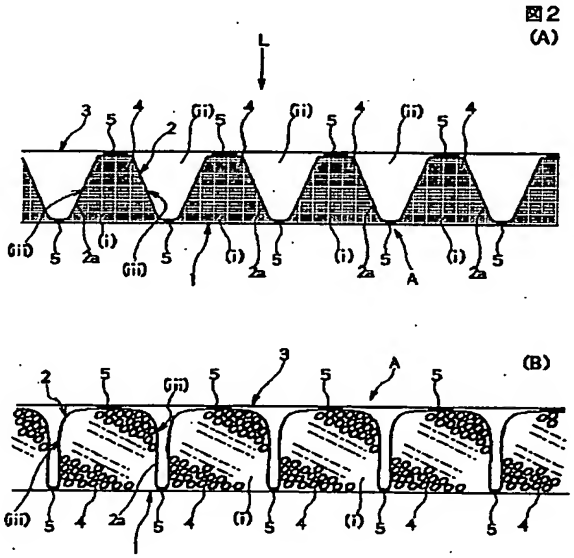
(54)【発明の名称】　吸収シートおよびその製造方法

(57)【要約】

【課題】　紙おむつや生理用品などに使用される吸収シートは、上層と下層の間に高吸収性物質が充填されているものであるが、着用者が動くことによって、上層と下層の間で高吸収性物質が移動して均一に分散されず吸収性が落ちたり、また吸水により生じたゲルがだんご状に固まって吸収シートの破れやちぎれを生じ、着用者に不快感を与えるものであった。

【解決手段】　吸収シートＡは中層２、第１の外層１、第２の外層３からなり、中層シート２はクレープ加工された吸水性シートに多数の凹部２ａが形成されてなる。この凹部２ａ内にＳＡＰ４を充填し、前記中層２の上下において第１の外層１と第２の外層３を水不溶性の接着剤５により接着する。このように構成することにより、ＳＡＰ４は常に凹部２ａ内に収納され、ＳＡＰ４の膨潤が抑制されることがないため、吸収シートＡを高吸収性で且つ薄型にできる。

図２



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【特許請求の範囲】

【請求項１】　クレープを有する吸水性シートに多数の凹部が形成されている中層と、前記凹部に収容された吸水性樹脂と、前記吸水性樹脂が収容された凹部の開口側を塞ぐように前記中層に重ねられた第１の外層と、この第１の外層と逆側にて前記中層に重ねられる第２の外層とを有し、この第１の外層と第２の外層の少なくとも一方が透液性シートで形成され、前記中層と第１の外層および中層と第２の外層とが接合されていることを特徴とする吸収シート。

【請求項２】　第１の外層と第２の外層との間で且つ中層の隣接する凹部の間に、前記中層と吸水性樹脂とが液を吸収した際の前記凹部の膨張を許容する領域が設けられている請求項１記載の吸収シート。

【請求項３】　透液性シートで形成された第２の外層が液を受ける側に向けられ、第１の外層は、前記第２の外層よりも繊維が密となるシートにより形成され、この第１の外層により前記吸水性樹脂が凹部内から外部へ出ることが防止されている請求項１または２記載の吸収シート。

【請求項４】　中層と第１の外層および中層と第２の外層は、水不溶性の接合手段により互いに接合されている請求項１ないし３のいずれかに記載の吸収シート。

【請求項５】　クレープを有する吸水性シートに多数の凹部を加圧成形して中層を形成する第１の工程と、前記中層の凹部に吸水性樹脂を入れる第２の工程と、前記吸水性樹脂が収容された凹部の開口側を塞ぐように前記中層に第１の外層を接合する第３の工程と、前記第１の工程以降に、前記第１の外層と逆側にて前記中層に第２の外層を接合する工程とを有し、前記第１の外層と第２の外層の少なくとも一方を透液性シートで形成することを特徴とする吸収シートの製造方法。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、紙おむつや生理用ナプキンなどに設けられる吸収シートに係り、特に薄型で高吸収性の吸収シートおよびその製造方法に関する。

【０００２】

【従来の技術】紙おむつや生理用ナプキンなどでは、不透液性の樹脂シートから成る外装シートと、着用者の肌に直接当たる内側のトップシートとの間に、尿や経血などの体液を吸収するための吸収シートが設けられる。この吸収シートは、薄葉紙などの上層と下層の間に、粉砕されたパルプにポリアクリル酸塩などの高吸水性樹脂（高吸水性ポリマー；ＳＡＰ）が介在したものが一般的に使用されている。ＳＡＰはパルプ以上に吸液性が高いため、パルプのみで吸収シートを構成したものに比べ体液の吸収性に優れ、吸収シートを薄型化できる。またＳＡＰは、吸水（吸液）すると膨潤しゲル状に固まるため、吸収された体液を吸収シート内に確実に保持でき、

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吸収された体液の逆戻り、洩れ等を防止できる。また、ＳＡＰは乾燥時には粉末状（粒状）で、吸水するとゲル状となるため、パルプのみを用いたものに比べて吸収シートが柔らかくなり、着用者の体の形に添って容易に変形が可能であり装着感が良好となる。

【０００３】

【発明が解決しようとする課題】しかし、吸水性を高めるために、パルプに対するＳＡＰの量を多くすると、吸水前の乾燥時において、ＳＡＰ粉末が着用者の動きにより上層と下層の間で移動し、ＳＡＰの分布にむらができる。したがって、体液がＳＡＰの少ない部分に接したときに、体液を完全に吸収できず吸収性が落ちてしまう。また、吸水により形成されたゲルが上層と下層の間を移動してだんご状に固まったり、またこの塊により２層の薄葉紙の破れやちぎれが生じ、着用者に不快感を与えるなどの問題があった。

【０００４】以上の問題を解決するために、例えば特公昭６１－３００４１号公報や特開平６－２５４１１８号公報および特公平７－７３５９１号公報、さらに実公昭６３－２３０７８号公報には、シート上に高吸水性物質が所定量ずつ間隔をあけて配置されてシート全面に分散され、この上から凹凸の形成されたカバーシートが被せられて前記シートと接合された吸収シートに関する発明が記載されている。このように高吸水性物質が所定量ずつ吸収シート全体に均一に分散され、且つカバーシートにより配置位置から動かないよう押さえられたものでは、高吸水性物質の吸収シート内での移動を防止でき、吸収シートの厚さを全体で一定に保つことができ、しかも吸水量を多くできる。

【０００５】しかし、前記の吸収シートでは、カバーシートを被せるときにカバーシートの凹部に高吸水性物質が収納されるよう位置合わせをしなくてはならず、製造に手間がかかる。また、高吸水性物質の膨潤を妨げないように、前記カバーシートの凹部の深さおよび径を大きくして、高吸水性物質の量よりも凹部内の空間を大きくしておく必要があるため、吸収シートの厚さ寸法が大きくなり、薄型化に限界を生じる。また、薄型化するために前記カバーシートの凹部の空間を小さくすると、吸水時に高吸水性物質の膨潤が凹部に妨げられ、吸水性が低下してしまう。

【０００６】本発明は、上記従来の課題を解決するものであり、吸収シート内での高吸水性物質の移動を防止でき、また吸水したときにシート内で膨潤できるようにして厚さ方向への膨らみを生じにくくした、高吸収性で且つ薄型の吸収シートおよびその製造方法を提供することを目的としている。

【０００７】

【課題を解決するための手段】本発明の吸収シートは、クレープを有する吸水性シートに多数の凹部が形成されている中層と、前記凹部に収容された吸水性樹脂と、前

記吸水性樹脂が収容された凹部の開口側を塞ぐように前記中層に重ねられた第１の外層と、この第１の外層と逆側にて前記中層に重ねられる第２の外層とを有し、この第１の外層と第２の外層の少なくとも一方が透液性シートで形成され、前記中層と第１の外層および中層と第２の外層とが接合されていることを特徴とするものである。

【０００８】さらに、第１の外層と第２の外層との間で且つ中層の隣接する凹部の間に、前記中層と吸水性樹脂とが液を吸収した際の前記凹部の膨張を許容する領域が設けられているものである。

【０００９】また、透液性シートで形成された第２の外層が液を受ける側に向けられ、第１の外層は、前記第２の外層よりも繊維が密となるシートにより形成され、この第１の外層により前記吸水性樹脂が凹部内から外部へ出ることが防止される構造とすることができる。

【００１０】上記において、中層と第１の外層および中層と第２の外層は、水不溶性の接合手段により互いに接合されていることが好ましい。

【００１１】また本発明の吸収シートの製造方法は、クレープを有する吸水性シートに多数の凹部を加圧成形して中層を形成する第１の工程と、前記中層の凹部に吸水性樹脂を入れる第２の工程と、前記吸水性樹脂が収容された凹部の開口側を塞ぐように前記中層に第１の外層を接合する第３の工程と、前記第１の工程以降に、前記第１の外層と逆側にて前記中層に第２の外層を接合する工程とを有し、前記第１の外層と第２の外層の少なくとも一方を透液性シートで形成することを特徴とするものである。

【００１２】本発明の吸収シートは、紙おむつや生理用ナプキンなどに装填され、吸水体として使用される。実際の使用状態では、本発明の吸収シートの一方の外層の外側に不透液性の樹脂シートが外装シートとして設けられ、他方の外層の外側に肌に触れるトップシートが設けられる。この発明では、好ましくは、中層の凹部を塞いでいる第１の外層が前記外装シート側に、第２の外層がトップシート側に向けられ、この第２の外層が液を受ける側となる。

【００１３】中層は、レーヨン紙またはパルプ紙などの吸水性シートにクレープ加工が施されて多数の微細な皺が形成され、さらに全面に多数の互いに独立した凹部が凹凸のローラにより加圧形成されたものが使用される。中層が液を吸収すると前記クレープ加工による微細な皺がほどけて回復し中層を構成する吸水シートが伸びることができる。前記凹部の中には例えばポリアクリル酸塩などの高い吸水性と保水性の高吸水性樹脂（高吸水性ポリマー；ＳＡＰ）が収容される。このＳＡＰとしては、前記ポリアクリル酸塩系、ポリビニルアルコール系、ポリアクリルアミド系などの合成ポリマー系、またはデンプン系やセルロース系など種々のものが使用可能である。また、中層の上下に重ねられる第１の外層および第２の外層の少なくとも一方は、例えばレイヨン紙、レイヨンスパンレイスなどの透液性を有するシートにより形成される。また、第１の外層と第２の外層のうち、液を受けない側に向けられるものは、必ずしも透液性シートである必要はない。

【００１４】中層の凹部内に収容されたＳＡＰが尿や経血などの体液を吸収すると、膨潤しゲル状となる。本発明では、ＳＡＰが収容される凹部が形成された中層が、クレープを有する吸水性シートで構成されているため、ＳＡＰが膨潤すると同時に凹部でのクレープ皺が伸びる。このクレープの皺の伸びによりＳＡＰの膨潤が妨げられず、ＳＡＰの吸水機能を十分に生かすことができる。特に図２（Ａ）に示すように、第１の外層と第２の外層の間において、中層の隣接するＳＡＰが収容された凹部の間に領域（ｉｉ）が形成されていると、この領域（ｉｉ）が凹部の膨張を許容し、凹部が十分に膨らむ。そのため、吸液量が多くなっても、第１の外層と、第２の外層との間隔があまり広がらず、吸液後に全体の厚さ寸法があまり大きくならない。

【００１５】このように、中層の凹部は吸液により膨張でき、第１の外層と第２の外層の間にその膨張領域も確保できるため、吸水前の凹部内の空間容積は乾燥状態のＳＡＰ粉末を収納できる程度の大きさに形成されていればよく、すなわち従来例のように、ＳＡＰを収容する領域にＳＡＰが膨潤するための空間を形成しなくてもよいため、凹部の深さを小さくできる。また凹部内へのＳＡＰの収容率を高くでき例えば凹部の容積に対し、ＳＡＰを７０％以上の率で収容することが可能で、高吸水性で且つ薄型のものとなる。

【００１６】また、凹部内に収容されたＳＡＰの膨潤を許容できるようにするためには、クレープ加工によるシートの伸び率（クレープ率）が５％以上で６５％以下であることが好ましい。このクレープの伸び率（クレープ率）とは、クレープ加工された吸水性シートの長さをＸ、これを水に浮かべ伸びた後の寸法をΔXとしたときに、｛（$\Delta X - X$）／Ｘ｝×１００（％）で表わされる。

【００１７】また中層を構成する吸水性シートの凹部内にＳＡＰが収容された後に、中層の上下に第１の外層および第２の外層が接合されるが、この接合には水不溶性の接合手段を用いることが好ましい。

【００１８】この水不溶性の接合手段は、例えばオレフィン系（ポリエチレンまたはポリプロピレン）やＥＶＡ系のホットメルト接着剤による接着接合の他、中層、第１の外層および第２の外層にポリエチレンまたはポリプロピレンなどを織り込んで、この３層を重ねた後に熱溶着させて接合するなどの手段を含む。中層と第１の外層および中層と第２の外層とを水不溶性の接合手段により接合することにより、体液を吸収したときの各層間の接

合強度を高く維持できる。

【００１９】前記ホットメルト接着剤を用いる場合、第１の外層および第２の外層の接合面に前記接着剤が、例えばスパイラル状（螺旋状）に塗布されて、それぞれ中層と接合される。

【００２０】図２（Ａ）に示すように、第１の外層は、中層の凹部の開口部側との間にて接合され、第２の外層は、前記凹部の底側において中層と接合される。このように、凹部の開口部周囲と凹部の底において、中層が第１の外層および第２の外層に接合されているので、ＳＡＰは凹部内に確実に保持され、吸収シート内でのＳＡＰの移動が防止される。また図２（Ａ）に示すように、第１の外層と第２の外層との間に、凹部が膨張する領域（ｉｉ）を確保できる。よって、吸収シート内にＳＡＰが均一に分散されて、吸収シートの吸収性が落ちることはなく、且つ吸水により形成されたＳＡＰのゲル状の固まりが移動してだんご状に固まることなどがなく第１の外層と第２の外層内で膨張できるようになる。よって液を吸収したときにＳＡＰに均一に吸収させることができ、また吸収後にシートが極端に厚くなることがない。

【００２１】また、吸収シートの第１の外層および第２の外層は、レーヨン紙やレーヨンスパンレイスなどであり、第１の外層は中層の凹部の開口側を閉じるよう中層に接合され、第２の外層は凹部の底面にて中層と接合される。この第２の外層が体液受容側（トップシート側）に向けられるよう紙おむつなどに装填される。第２の外層は体液を受容する側に向けられているため、体液が透過できるよう目が粗な紙または不織布が使用される。また、第１の外層には中層の凹部内のＳＡＰが外層の目の間から外側に洩れないよう、目が密な紙または不織布が使用されることが好ましい。このように、第１の外層および第２の外層には目の粗さの異なる２種の紙または不織布が使用される。あるいは、ポリエチレン（ＰＥ）またはポリプロピレン（ＰＰ）などが織り込まれた同一の不織布を第１の外層および第２の外層として使用し、第１の外層に熱ローラをかけて、織り込まれたＰＥまたはＰＰを溶かして目を詰まらせて密にし、凹部内のＳＡＰが落ちないようにしてもよい。

【００２２】このように、本発明では吸収シート内にＳＡＰを均一に分散させることができ、中層の凹部内の空間をＳＡＰの膨潤に合わせて広げることができるので、高吸収性で且つ薄型の吸収シートを提供できる。

【００２３】

【発明の実施の形態】図１は本発明の吸収シートの層の構成を示す分解斜視図、図２は、吸収シートの吸水（吸液）機能を模式的に示しているものであり、図２（Ａ）は乾燥状態（吸液前の状態）、図２（Ｂ）は吸水（吸液）後の状態を示す部分断面図である。図１に示す吸収シートＡは、第１の外層１および第２の外層３の間に中層２が挟まれた３層の積層構造となっている。図１では、第１の外層１を上向きにして示しているが、実際の使用状態では、図２（Ａ）（Ｂ）に示すように、第１の外層１が下層となり、第２の外層３が上層となって、この第２の外層３が尿や経血などの体液Ｌを受ける側に向けられる。

【００２４】第１の外層１と第２の外層３は、共にレーヨン紙またはレーヨンスパンレイスなどの透水性または透液性の紙または不織布から形成され、その目付は１５～２５ｇ／ｍ²である。中層２は、レーヨン紙またはパルプ紙などの吸水性シートにクレープ加工が施され、長さ方向（Ｘ方向）に直交する向きの多数の微細な皺が形成されている。吸水性シートのクレープ加工前の目付は１５～２５ｇ／ｍ²である。この吸水性シートが水分を吸収すると、前記クレープ加工による微細な皺がほぐれて回復し、吸水性シートがＸ方向に伸びる。中層２となる吸水性シートは、多数の凹凸が形成されて互いに噛合うように構成された一対のローラに挟まれて送り出され、その結果、多数の互いに独立した凹部２ａが加圧成形される。

【００２５】図２（Ａ）（Ｂ）に示すように、前記複数の凹部２ａにはポリアクリル酸塩などの高吸水性樹脂（ＳＡＰ）４が収容されている。前記ＳＡＰ４は、高吸水性であり、乾燥時は粉末または粒状で水分を吸収すると膨潤してゲル状となる。第１の外層１および第２の外層３の接合面に、ポリエチレン（ＰＥ）またはポリプロピレン（ＰＰ）などのポリオレフィン系またはＥＶＡ系の水不溶性接着剤であるホットメルト接着剤５が塗布されて、この両層の間に中層２が挟まれ、中層２と第１の外層１、および中層２と第２の外層３とが接合される。

【００２６】３層構造の吸収シートＡでは、図２（Ａ）に示すように、中層２と第１の外層１は凹部２ａの開口周縁部で接着接合され、中層２と第２の外層３は凹部２ａの底部で接着接合されている。凹部２ａの開口部が第１の外層１で閉鎖されているため、凹部２ａと第１の外層１とで袋状部（ｉ）が形成され、ＳＡＰ４はこの袋状部（ｉ）内に封じられて保持されている。よって、着用者の動きにより、ＳＡＰ４が吸収シートＡ内を移動することはない。

【００２７】ＳＡＰ４が前記袋状部（ｉ）に保持されて吸収シートＡ内に一定量ずつ均一に分散しているため、吸収シートＡの広い範囲において均一な高吸水性を確保できる。また、層どうしの接合は水不溶性の接着剤５で接合されているので、体液が与えられたとき接合部分の接着強度が低下しない。そのため、体液を吸収した後に３層が互いに剥がれることはなく、吸収シートＡ内でのＳＡＰ４の移動を防止できる。また、ＳＡＰ４は各袋状部（ｉ）内に分散して適量ずつ設けられているため、体液を吸収したときに多くのＳＡＰがだんご状に固まることがなく、各層のちぎれや破れを防止でき、着用者に不快感を与えない。また、第１の外層１、中層２、および

第２の外層３のそれぞれにＰＥまたはＰＰ樹脂などを織り込んで、熱溶着により接着させても、同様に水不溶性の接合手段を実現できる。

【００２８】また図２（Ａ）に示すように、第１の外層１と第２の外層３との間において、中層２の隣接する凹部２ａ（袋状部（ｉ））の間には、第１の外層１と第２の外層３とが接着されない領域（ｉｉ）が形成されている。体液を吸収したＳＡＰ４が膨潤し、また袋状部（ｉ）が膨張したときに、前記領域（ｉｉ）がこの膨張を許容できるようになる。この吸収シートＡの製造方法は、前記のように、クレープ加工された（クレープを有する）吸水性シートに多数の凹部２ａを加圧成形して中層２の形状を確定した後、前記凹部２ａ内に粉末状または粒状のＳＡＰ４を収容し、第１の外層１を凹部２ａの開口側に重ねて接着剤５で接合する。また前記工程のいずれかにおいて、中層２の凹部２ａの底部側に第２の外層３を重ね前記接着剤５により接合する。なお、この接合の際、第１の外層１と第２の外層３の接合面に前記接着剤５をスパイラル状に塗布する。

【００２９】この吸収シートＡでは、第２の外層３側から体液が与えられるので、第２の外層３は体液を透過させるよう目が粗い紙または不織布などの透液性に優れたシートが使用される。また、第１の外層１は、吸水前の乾燥時に凹部２ａ内のＳＡＰ４の粉末が外側に洩れないよう、目が密な紙または不織布が使用される。また、第１の外層１は必ずしも透液性シートである必要はない。第１の外層１と第２の外層３は目の粗さが異なるので、目が密と粗の２種類の紙または不織布が製造されて使用される。あるいは、中層２と第１の外層１および第２の外層３にＰＥまたはＰＰが織り込まれていて、これら３つの層が熱溶着により接合されるときは、第１の外層１および第２の外層３として同一の不織布を使用し、熱溶着のときに第１の外層１に余分に熱ロールをかけて不織布中のＰＥまたはＰＰを溶融させて目を詰まらせ、これによりＳＡＰ４の洩れを防止してもよい。

【００３０】中層２と第１の外層１および第２の外層３が接合されて吸収シートＡが形成された後、パターン積繊、カッター刃によるカッティング、またはウオータージェットなどの切断が行われ、紙おむつや生理用ナプキンなどの形に合わせて所定の形状に裁断される。そして第２の外層３が体液を受容する側、すなわち着用者の肌に触れるトップシート側に向けられ、第１の外層１が外側の不透液性の外装シートに向けられて、吸収シートＡが外装シートとトップシートとの間に装填される。

【００３１】この吸収シートＡが装填された紙おむつまたは生理用ナプキンが着用され、図２（Ａ）にてＬで示す側から体液が第２の外層３に与えられると、体液は第２の外層３を透過して中層２を構成する吸水性シートに吸収されると共にＳＡＰ４に吸収される。ＳＡＰ４は、体液を吸収して膨潤しゲル状になる。体液を吸収した中層２は、クレープ加工の皺がほどけて回復する。よって凹部２ａの容積が拡大可能となり、ＳＡＰ４は凹部２ａの内壁の広がりとともに膨潤できる。このとき凹部２ａの開口部と底部はそれぞれ水不溶性の接着剤５により第１の外層１と第２の外層３に接合されているため、液を吸収したときのクレープ皺の回復による伸びは、接着剤５が塗布されている部分では抑制され、凹部２ａの周壁部分（ｉｉｉ）が比較的自由に伸びるようになる。よって図２（Ｂ）に示すように、ＳＡＰ４の膨潤により凹部２ａ（袋状部（ｉ））は、側方の領域（ｉｉ）内に膨張する。この領域（ｉｉ）が袋状部（ｉ）の膨張を許容し、また水不溶性の接着剤５による接着部では中層２のクレープ皺の回復が抑制されるため、ＳＡＰ４の膨潤により、吸収シートの厚さ方向への膨張量は比較的少なくなり、体液を吸収した後も薄型の状態を維持できる。

【００３２】前記凹部２ａ（袋状部（ｉ））の膨張具合はクレープの形成率により異なるが、クレープ伸び率が５％以下であると、凹部２ａの広がりが抑制されて充分な吸水性を実現できず、クレープ伸び率が６５％以上であると、凹部２ａが大きく伸びすぎて、中層２の全面積に対する水不溶性の接着剤５による接合面積の比率が極端に低下し、吸収シート全体の強度が低下する。また、クレープ伸び率が前記６５％以上であると、凹部２ａ（袋状部（ｉ））が領域（ｉｉ）内のみならず厚さ方向へも大きく膨張し、体液吸収後の吸収シートの厚さ寸法が不必要に大きくなる。したがって、中層２はクレープの伸び率が５％以上で６５％以下になるようにクレープ加工されるのが望ましい。また、通常のクレープ加工は吸水性シートの長さ方向（Ｘ方向）に直交する方向へ皺が延びるように加工されているが、長さ方向と直交する方向および長さ方向の双方へ向けてクレープ加工をクロス成形すると、凹部２ａを全方向に拡大させることができ、さらに効果的にＳＡＰ４の膨潤を許容できる。

【００３３】前記凹部２ａは、クレープ加工により形成された微細な皺のほぐれ（回復）により、ＳＡＰの膨潤に対応して膨張するため、吸水（吸液）前の乾燥状態において、凹部２ａにＳＡＰ４が膨潤するのに必要な空間を開けておく必要はなく、凹部２ａ内にＳＡＰ４を７０％以上の収容率により収容することが可能である。また、吸収シートの単位面積あたりの吸液量は、前記凹部２ａの数および深さにより設定することができる。吸収シートＡでの尿や経血の吸収量を十分に確保するためには、凹部２ａの区画個数を２個／ｃｍ²以上で１３個／ｃｍ²以下程度に設定することが好ましい。また凹部２ａの開口部での縦と横の２辺の寸法は３～５ｍｍで、凹部２ａの深さを１～３ｍｍ程度に設定しておくことにより、凹部内のＳＡＰ４にて体液を十分に吸収でき、また厚さ寸法があまり大きくならず、好ましいものとなる。

【００３４】

【発明の効果】以上詳述したように、本発明の吸収シー

トによれば、吸水性樹脂が中層の全面に形成された凹部内に収容されているため、吸水性樹脂を吸収シート全体に均一に分散させることが可能である。また、前記凹部は吸水することにより広がり、吸水性樹脂の膨潤を許容でき、また、外層間に前記凹部が膨張する領域が形成されるため、吸水性樹脂の吸収機能を十分に発揮でき、吸収性が高くしかも薄型の吸収シートを実現できる。

【図面の簡単な説明】

【図１】本発明の吸収シートの層構造を示す分解斜視図、

【図２】（Ａ）は吸水前の吸収シートの断面図、（Ｂ）＊

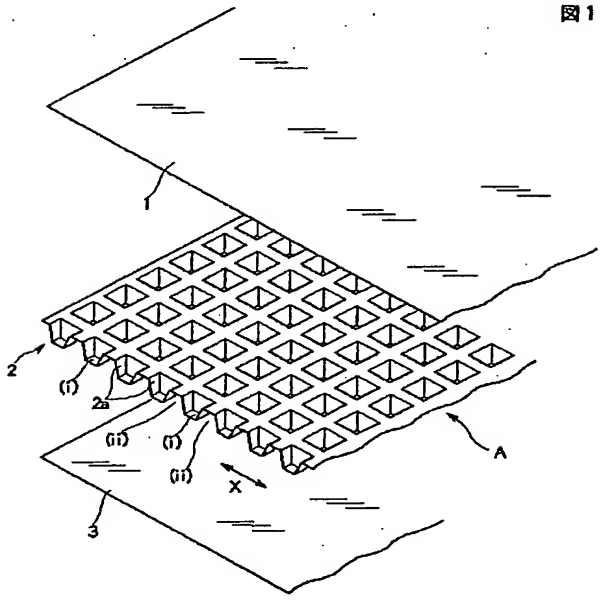
＊は吸水後の吸収シートの断面図、

【符号の説明】

１　第１の外層
２　中層
２ａ　凹部
３　第２の外層
４　ＳＡＰ
５　水不溶性の接着剤
Ａ　吸収シート
（ｉ）　袋状部
（ｉｉ）　領域

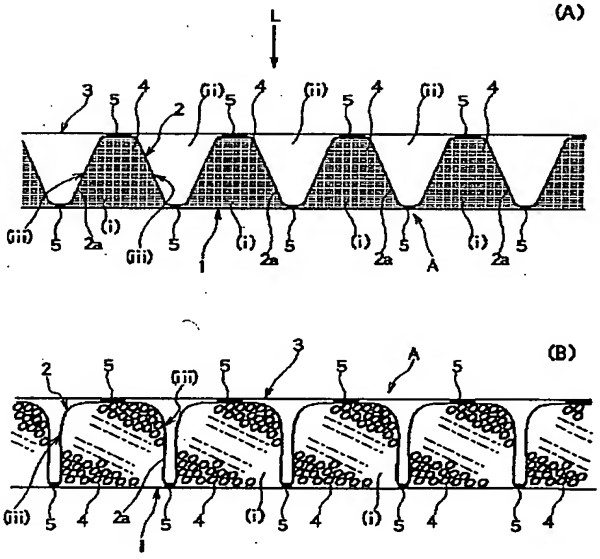
【図１】

図1



【図２】

図2
(A)



(B)